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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,620	03/01/2004	Siegfried Gronbach	S. Gronbach 3 (LCNT/12632	8834

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PATTERSON & SHERIDAN, LLP/
LUCENT TECHNOLOGIES, INC
595 SHREWSBURY AVENUE
SHREWSBURY, NJ 07702

EXAMINER	
STULTZ, JESSICA T	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 12/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/790,620	GRONBACH, SIEGFRIED	
	Examiner	Art Unit	
	Jessica T. Stultz	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *11-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Examiner's Comments

For applicant's information, the amendments to claims 5 and 10 overcome the previous objection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-7, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by McBrien et al US 2002/0114047 (herein referred to as McBrien et al '047).

Regarding claim 1, McBrien et al '047 discloses a method of controlling a bias voltage of a Mach-Zehnder modulator performing a non-return-to-zero (NRZ) modulation of an optical signal (Sections 18-24, wherein the bias voltage of NRZ Mach-Zehnder modulator "20" is controlled, Figure 1), comprising: generating a digital pilot signal (Sections 18-24, wherein the digital pilot signal is generated by digital data source "70", Figure 1); modulating the Mach-Zehnder modulator using the digital pilot signal (Sections 18-24, wherein the modulator "20" is modulated by the signal "21" input into the modulator); coupling a portion of an optical output signal from the Mach-Zehnder modulator to a light detector (Sections 25-27, wherein a portion of the output signal is coupled by coupler "113" to detectors "120" and "122", Figure 1); processing an output optical signal of the light detector using a digital correlation filter to recover the digital pilot signal (Sections 28-30, wherein the output of the detectors "120" and "122" is

processed by band pass filter "124", Figure 1); and demodulating the recovered digital pilot signal to produce a feedback signal controlling the bias voltage of the Mach-Zehnder modulator (Sections 24-33, wherein the digital signal is demodulated by demodulator "130" and recovered as a feedback signal through the DC bias control circuit and enters the modulator as DC bias signal "23", Figure 1).

Regarding claim 6, McBrien et al '047 discloses a method of controlling bias voltages of an input Mach-Zehnder modulator and an output Mach-Zehnder modulator coupled for performing a return-to-zero (RZ) modulation of an optical signal (Sections 18-24, wherein the bias voltages of RZ Mach-Zehnder modulator "10" and NRZ modulator "20" are controlled, Figure 1), comprising: generating a digital pilot signal (Sections 18-24, wherein the digital pilot signal is generated by digital data source "70", Figure 1); modulating sequentially the input Mach-Zehnder modulator or the output Mach-Zehnder modulator using the digital pilot signal (Sections 18-24, wherein the modulator "20" is sequentially modulated by the signal "21" input into the modulator); coupling a portion of an optical output signal from the output Mach-Zehnder modulator to a light detector (Sections 25-27, wherein the a portion of the output signal from modulator "20" is coupled by coupler "113" to detectors "120" and "122", Figure 1); processing an output optical signal of the light detector using a digital correlation filter to recover the digital pilot signal (Sections 28-30, wherein the output of the detectors "120" and "122" are processed by band pass filter "124", Figure 1); and demodulating the recovered digital pilot signal to produce a feedback signal controlling a bias voltage of a Mach-Zehnder modulator using the digital pilot signal during at least a data sampling period of the processing step (Sections 17, 24-33, wherein the digital signal is demodulated by demodulator "130" and recovered as a feedback

signal through the DC bias control circuit and enters the modulator as DC bias signal "23", Figure 1).

Regarding claims 2 and 7, McBrien et al '047 further discloses that the digital pilot signal is a digitized sinusoidal signal (Sections 18-24, wherein the pilot signal is sinusoidal as shown in "15", Figure 1).

Regarding claims 5 and 10, McBrien et al '047 further discloses that the demodulating step further includes using a digital synchronous demodulating technique (Sections 24 and 28-30, wherein the demodulator is a digital synchronous demodulator "130", Figure 1), and generating a signal while maintaining a bias voltage of the Mach-Zehnder modulator at a quadrature bias point (Sections 24 and 28-30, wherein the signal is generated at a quadrature bias point).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-4 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over McBrien et al '047, as applied to claims 1 and 6 above, respectively, in view of Kingsley et al.

Regarding claims 3-4 and 8-9, McBrien et al '047 further discloses that the filtering of the output signal of the light detector includes using a band-path filter (Sections 28-30, wherein the output of the detectors "120" and "122" are processed by band pass filter "124", Figure 1), but does not specifically disclose digitizing the output optical signal of the light detector using an

analog-to-digital converter; sampling the output signal of the A/D converter; and applying a digital correlating technique, specifically including time-domain averaging a pre-determined number of samples of the output signal of the A/D converter, to recover the digital pilot signal. Kingsley et al teaches of modulating a digital signal (Column 9, lines 3-45, wherein the signal from light source "20" is modulated by modulator "30" and is input into photodetector "40", Figure 1) wherein digitizing the output optical signal of the light detector includes using an analog-to-digital converter (Column 16, line 17-Column 17, line 13, wherein the signal exiting the photodetector "40" is digitized by A/D converter "195", Figure 14); sampling the output signal of the A/D converter (Column 16, line 17-Column 17, line 43, wherein the output of the converter is sampled); and applying a digital correlating technique, specifically including time-domain averaging a pre-determined number of samples of the output signal of the A/D converter, to recover a digital pilot signal (Column 16, line 17-Column 17, line 43, wherein the sliding averages of the samples is determined and a digital signal "173" is recovered, Figure 14) for the purpose of processing an analog signal into digital bits and analyzing the data to produce the desired signal compared to a threshold signal (Column 16, line 17-Column 17, line 43). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the method of controlling bias voltages of a Mach-Zehnder modulator of McBrien et al '047 to further include steps of digitizing the output optical signal of the light detector using an analog-to-digital converter; sampling the output signal of the A/D converter; and applying a digital correlating technique, specifically including time-domain averaging a pre-determined number of samples of the output signal of the A/D converter, to recover at least one of the digital pilot signal or a first harmonic of the digital pilot signal since Kingsley et al teaches

of modulating a digital signal wherein digitizing the output optical signal of the light detector includes using an analog-to-digital converter; sampling the output signal of the A/D converter; and applying a digital correlating technique, specifically including time-domain averaging a pre-determined number of samples of the output signal of the A/D converter, to recover a digital pilot signal for the purpose of processing an analog signal into digital bits and analyzing the data to produce the desired signal compared to a threshold signal.

Response to Arguments

Applicant's arguments filed October 3, 2005 regarding the 102 rejections of claims 1-2, 5-7, and 10 over McBrien et al'047 have been fully considered but they are not persuasive. In response to applicant's argument that McBrien et al'047 does not disclose recovering any pilot signals to assist in the biasing of modulators, the examiner disagrees since McBrien et al'047 discloses modulating a Mach-Zehnder modulator using the digital pilot signal (Sections 18-24, wherein the modulator "20" is modulated by the signal "21" input into the modulator) and demodulating a recovered digital pilot signal to produce a feedback signal controlling the bias voltage of the Mach-Zehnder modulator (Sections 24-33, wherein the digital signal is demodulated by demodulator "130" and recovered as a feedback signal through the DC bias control circuit and enters the modulator as DC bias signal "23", Figure 1).

Applicant's arguments filed October 3, 2005 regarding the 103 rejections of claims 3-4 and 8-9 over McBrien et al '047 in view of Kingsley et al have been fully considered but they are not persuasive. In response to applicant's argument that Kingsley et al is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned,

in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Kingsley et al is used as a reference sine it pertinent to the art of since it uses an A/D converter to develop a digital signal from an analog signal to produce a desired signal as compared to a threshold signal (Column 16, line 17-Column 17, line 43).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica T. Stultz whose telephone number is (571) 272-2339. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jessica Stultz
Patent Examiner
AU 2873
December 1, 2005

JORDAN SCHWARTZ
PRIMARY EXAMINER